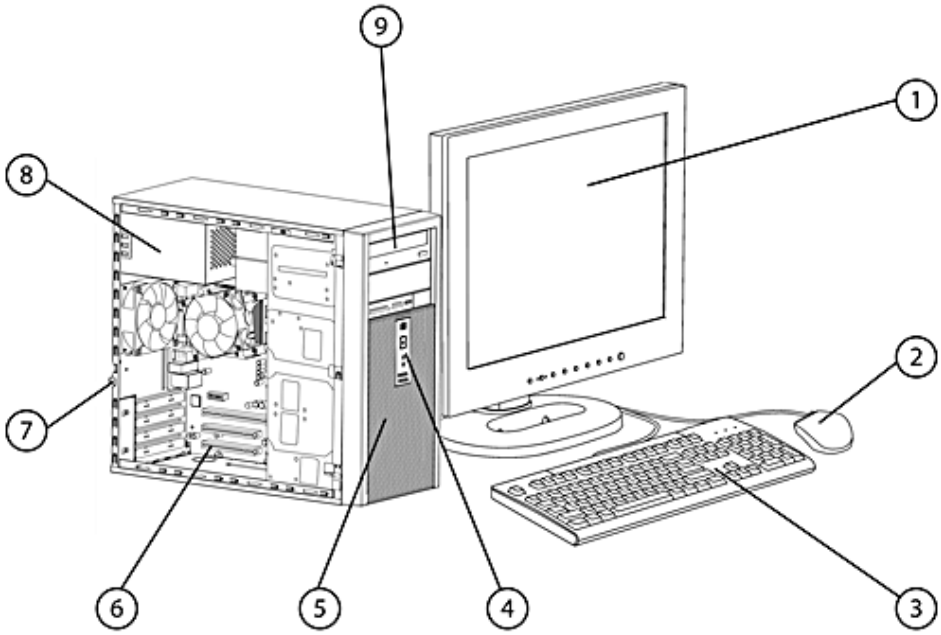
Overview

HP Compaq dx2250 Microtower Business PC

HP recommends
Windows Vista™ Business

Microtower



1. Monitor (sold separately)
2. PS/2 Scroll Mouse
3. HP Standard Keyboard
4. (2) USB 2.0 ports, audio ports
5. (2) internal 3.5" drive bays
6. (2) full-height PCI 2.3 slots, (1) PCI-E x1 slot, (1) PCI-E x16 slot
7. (4) USB 2.0 ports, (1) serial port, (1) parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) audio in – (1) audio out – (1) MIC
8. 250-watt max power supply
9. (2) external 5.25" drive bays for optional optical drives; (1) external 3.5" drive bay for optional media reader or diskette drive

At A Glance

- AMD Athlon™ 64 X2 Dual-Core, Athlon 64, and Sempron™ processors with HyperTransport™ technology
- ATI Radeon Xpress 1150 chipset
- Built-in ATI graphics processor
- PCI Express I/O bus
- Integrated SATA 3.0-Gb/s controller
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- Integrated Fast Ethernet 10/100 Network Connection
- Choice of hard drives and optical drives
- DDR2 SDRAM system memory
- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.

NOTE: All models and features may not be available in all countries.

Available Technology and Features

Processor and Speed One of the following	AMD Sempron Processors with HyperTransport Technology:	
	AMD Sempron 3400+ Processor (1.8-GHz, 256K L2 cache, 1600-MHz FSB)	
	AMD Sempron 3600+ Processor (2.0-GHz, 256K L2 cache, 1600-MHz FSB)	
	AMD Athlon 64 Processors with HyperTransport Technology:	
	Athlon 64 3800+ Processor (2.4-GHz, 512K L2 cache, 2000-MHz FSB)	
	AMD Athlon 64 X2 Dual-Core Processors with HyperTransport Technology:	
	Athlon 64 X2 3800+ Processor (2.0-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 4000+ Processor (2.1-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 4200+ Processor (2.2-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 4400+ Processor (2.3-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 4600+ Processor (2.4-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 4800+ Processor (2.5-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 5000+ Processor (2.6-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 5200+ Processor (2.6-GHz, 2MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 5400+ Processor (2.8-GHz, 1MB L2 cache, 2000-MHz FSB)	
	Athlon 64 X2 5600+ Processor (2.8-GHz, 2MB L2 cache, 2000-MHz FSB)	

Operating Systems	Preinstalled	Genuine Windows Vista Business 32* Genuine Windows XP Professional SP2 Genuine Windows XP Home SP2 Red Flag Linux (China Only) Free DOS (not available in China)

* Certain Windows Vista product features require advanced or additional hardware. See http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and http://www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor.

NOTE: Drivers for Windows Vista are continually being made available for download from http://www.hp.com. Windows Vista support for all hardware and software features of this product is planned by April 1, 2007.

Application Software (availability varies by region)	Microsoft Office 2007 Basic Microsoft Office 2007 SBE Microsoft Office 2007 Professional Microsoft Works Roxio DigitalMedia Plus (by SONIC)* Intervideo WinDVD* Symantec Antivirus 2005 with 60 day Live Update Subscription (availability varies by region) Sun Java Runtime Environment Google Toolbar

Available Technology and Features

* Supporting software available with certain optical drive configurations

Hard Drives	80-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 160-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 250-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm)
System Memory	512-MB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 512-MB) 512-MB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (2 x 256-MB) 1-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 1-GB) 1-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (2 x 512-MB) 2-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (2 x 1-GB)
Storage – One or more of the following (see Storage section below)	Diskette Drive 1.44-MB Diskette Drive Media Reader HP 16-in-1 Media Reader and additional USB 2.0 port Optical Drives (Serial ATA) SATA DVD-ROM Drive SATA DVD+/-RW (DL/DF) LightScribe Drive
Keyboard – One of the following	HP PS/2 Standard Keyboard HP USB Standard Keyboard
Mouse – One of the following	PS/2 2-Button Scroll Mouse PS/2 2-Button Optical Scroll Mouse USB 2-Button Optical Scroll Mouse
Audio	Realtek ALC861 High Definition audio codec 3D audio compliant with AC'97 Rev. 2.3 and HD Audio compatible Internal PC speaker
Communication	Integrated Realtek 8100C Fast Ethernet Network Connection Intel PRO/1000 PT PCIe Gigabit NIC Card Agere 56K PCI Modem
Graphics	Integrated ATI graphics processor ATI RADEON X1300 (256MB DH) PCIe Graphics Card ATI RADEON X1300 (256MB SH) PCIe Graphics Card

Miscellaneous	HP Firewire / IEEE 1394 PCI Card (full height)

System Details

Base Unit

- Micro ATX microtower chassis, including power supply and front bezel
- Five (5) drive bays and four expansion slots
- Microsoft operating system CD
- Active type heatsink
- 92 x 92 x 25 mm chassis fan
- System board with ATI Radeon Xpress 1150 chipset, integrated Realtek 8100C Fast Ethernet 10/100 Network Connection, integrated graphics and audio, 2 PCI slots, 1 PCI Express x1 slot, 1 PCI Express x16 slot, 2 DDR2 DIMM memory slots
- (4) Serial ATA data connectors
- (2) Serial ATA data cables
- Product documentation on CD
- Power cord

Slots	PCI	Two (2) full-height PCI 2.3 slots on PCA One (1) full-height PCI Express x1 slot on PCA One (1) full-height PCI Express x16 slot on PCA (for graphic cards)
	Memory Expansion	Two (2) DIMM slots (2 GB maximum memory support)
Bays	Internal	Two (2) 3.50"
	External	Two (2) 5.25” One (1) 3.50”
USB Support	EHCI high-speed USB 2.0 controller Two (2) front ports; Four (4) rear ports, Two (2) internal ports on motherboard	
Interfaces (Legacy)	One (1) parallel port One (1) serial port One (1) PS/2 keyboard port One (1) PS/2 mouse port One (1) analog VGA video port One (1) line in; one (1) line out; one (1) mic in One (1) RJ45 network port	
Weight and Dimensions	Chassis Dimensions (H x W x D)	13.90 x 6.89 x 16.38 in (353 x 175 x 416 mm)
	Packaged Dimensions (L x W x H)	22.25 x 19.63 x 16.31 in (565.15 x 498.5 x 414.3 mm) (NA) 21.10 x 19.53 x 15.008 in (536.0 x 496.0 x 383.0 mm) (EMEA)
	System Weight	21.16 lb (9.6 kg)
	Shipping Weight	30.86 lb (14.0 kg)

System Details

Technology and Features	Memory Type	• PC2-5300 DDR2 SDRAM (667-MHz) non-ECC • 4 GB maximum system memory
	Hard Drive Interfaces Supported	• Serial ATA 3.0-Gb/s hard drives are supported
Chassis	Front Panel	• Power button • Power On LED • HDD Activity LED
	Cooling Solutions Supported	• Power Supply Fan (variable speed) • Aluminum active heatsink (variable speed) • Chassis fan (variable speed)
	Slots Supported	Four (4) full-height expansion slots
	Front I/O	Two (2) USB 2.0 ports
	Rear I/O	Standard Micro ATX I/O connectors, including four (4) USB 2.0 ports
	Drive Bays	• Two (2) 5-1/4" external • One (1) 3-1/2" external • Two (2) 3-1/2" internal
	Internal Speaker	Standard
	Security	Padlock loop
	Power Supply	250-watt ATX Power Supply – PFC/non-PFC with a 115v/230v line switch (varies by country/region)
Unit Environment and Operating Conditions	General Unit Operating Guidelines	• Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range. • Leave a 4 in (10.2 cm) clearance on all vented sides of the computer to permit the required airflow. • Never restrict airflow into the computer by blocking any vents or air intakes. • Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air. • Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow. • If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.
	Temperature Range	• Operating: 50° to 95° F (10° to 35° C) • Non-operating: –22° to 140° F (–30° to 60° C)
	Relative Humidity	• Operating: 10% to 90% (non-condensing at ambient)

System Details

		• Non-operating: 5% to 95% (non-condensing at ambient)
	Maximum Altitude (unpressurized)	• Operating: 10,000 ft (3048 m) • Non-operating: 30,000 ft (9000 m)

NOTE: Operating temperature is de-rated 1.0 deg C per 1000 ft (300 m) to 10,000 ft (3000 m) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

System Board	Processor	• Socket AM2 industry standard Micro ATX form factor • Support single AMD Athlon 64 X2 Dual-Core, Athlon 64, or Sempron processor
	PWM	• Intersil 6566 VRM 10.1
	Chipset	• ATI RS485 (Northbridge), ATI SB600 (Southbridge)
	Super I/O	• W83627EHG
	Front Side Bus Frequency	• 533/800 MHz
	Memory	• DDR2 SDRAM • 2 x DIMM slots
	Clock Generator	• ICS 951412GLFT
	Integrated Graphics	• Built-in ATI graphics processor provided by the ATI Radeon Xpress 1150 chipset
	Audio	• Realtek ALC861 HD Audio compatible codec with two channel audio 3D audio compliant with AC'97 rev. 2.3
	LOM	• Realtek 8100c Fast Ethernet 10/100
	IDE	• Support all PIO modes • 1 x IDE ports support up to 2 devices • Support Ultra ATA 33/66/100
	Serial	• Four Serial ATA interfaces support data transfer rates up to 3.0 Gb/s
	Expansion Slots	• 2 x PCI 2.3 slots • 1 x PCI Express x1 slot

System Details

	• 1 x PCI Express x16 slot
BIOS	• LPC EEPROM
Industrial Standard	• PCI 2.3 compliant • USB 2.0
Rear Side I/O Ports	• 1 x PS/2 keyboard port • 1 x PS/2 mouse port • 4 x USB 2.0 ports • 1 x RJ-45 10/100 port • 1 x serial port • 1 x parallel port • 1 x DB 15 pin analog VGA port • 3 x audio ports
On Board I/O Interfaces	• 1 x ATX power connector • 1 x +12V power connector • 1 x Floppy connector • 1 x Front panel connector, Switch, LED (ON/Flash/OFF) • 2 x Fan headers for CPU, chassis, with voltage/fan speed control • 1 x ATAPI headers-CD IN • 1 x header to support 2 USB 2.0 ports at front side • 1 x header to support USB media reader
Board Size	• Micro-ATX, PCB Size: 9.6 x 9.0 in (24.38 x 22.86 cm) • 4-layer PCB with green color
Additional Features	• Bootable without keyboard, mouse or monitor • Keyboard/mouse/USB wake up • Support S3, S4 and S5 • ACPI status • Hardware monitor capability • CPU fan speed control

Network Interface	Integrated Realtek 8100C Fast Ethernet Network Controller
Hardware Highlights	• PCI interfaces
Features	• 10-Mbps and 100-Mbps operation
	Intel PRO/1000 PT PCIe Gigabit NIC Card
Hardware Highlights	• PCI interfaces

System Details

	Features	• 10-Mbps, 100-Mbps and 1000-Mbps operation
Wireless	Wireless A+G PCI Card (full height bracket)	
Power Supply	• ATX Power Supply – Passive PFC/non-PFC with a 115v/230v line switch • Passive Power Factor Correction (PFC) – with line switch set to 230V – No PFC in 115V line switch position • 90 to 140VAC, or 180 to 264VAC operating voltage range • 100 to 127VAC, or 200 to 240VAC rated voltage range • 50–60 Hz rated line frequency • 47–63 Hz operating line frequency range • 250 watt maximum rated power • 80-mm power supply fan – variable speed for optimum acoustics	
Power Conservation 'Energy Saver'	• Energy Star compliant • APM 1.2 support • Screen blanking • Hard drive 'Idle' mode • System Idle mode • ~2 watt power consumption in ES mode – suspend to RAM (S3) (instantly available PC) • Processor/Cache memory power-down (S3)	
System Environmental Specs	• Values are subject to change without notification and are for reference only. • Performance of system, options, and ancillary equipment will vary depending on the system configuration. • Levels presented do not account for non-HP/Compaq installed hardware.	
	Ambient Air Temperature	Operating: 50° to 95°F (10° to 35°C) at sea level with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 8000 ft (2500 m), no direct sustained sunlight. Maximum rate of change is 77°F/Hr (25°C/Hr). The upper limit may be limited by the type and number of options installed.
		Storage: –22° to 140°F (–30° to 60°C) – Maximum rate of change: 410°F/Hr (210°C/Hr).
	Humidity	Operating: 10% to 90% relative humidity (Rh), 86°F (30°C) maximum wet bulb temperature, non-condensing

System Details

	Storage	10% to 95% relative humidity (Rh), 101.66°F (38.7°C) maximum wet bulb temperature, non-condensing
Altitude	Operating	0 to 10,000 feet (0 to 3048 meters) – This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1,000 ft/min (304.8 m/min).
	Non-Operating	0 to 30,000 feet (0 to 9,144 meters) – Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min).
Shock	Listed are the levels of shock the product can withstand with NO damage being incurred. The values represent peak input acceleration during an 2~3 ms half-sine shock pulse, 11 ms trapezoidal shock pulse.	
	Non-Operating	40 g (Half-sine Shock) 40 g (Trapezoidal Shock)
Vibration	Listed are the levels of vibration the product can withstand with NO damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range.	
	Operating	Random vibration at 5Hz@0.00025G•/Hz, 10Hz@0.01G•/Hz, 100Hz@0.01G•/Hz, 300Hz@0.00001G•/Hz 5Hz to 300Hz, (0.25G's nominal).
	Non-Operating	Random vibration at 0.008G•/Hz, 10Hz to 500Hz, (2 Grms nominal).

Service and Support

On-site Warranty[Note 1]: One-year (1-1-1) limited warranty delivers one year of on-site, next business-day[Note 2] service for parts and labor and includes free telephone support[Note 3] 24 x 7. Global coverage[Note 2] ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. One-year onsite and labor are not available in all countries.

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

NOTE 3: Technical telephone support applies only to HP-configured Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

After-Market Options

Communications	NICs	
	Intel PRO/1000 PT PCIe Gigabit NIC Card	EH352AA
	Wireless LAN	
	HP Wireless A+G PCI Card (North America only)	EA118AA
	HP Wireless A+G PCI Card (WW except North America)	PZ928AA
	Modems	
	Agere 2006 PCI High-Speed 56K International SoftModem	EK694AA
Hard Disk Drives	HP 250-GB SATA 3.0-Gb/s Hard Drive	PY278AA
	HP 160-GB SATA 3.0-Gb/s Hard Drive	PY277AA
	HP 80-GB SATA 3.0-Gb/s Hard Drive	PY276AA
Removable Storage Devices	Diskette Drive	
	HP 1.44-MB Internal Diskette Drive	AG295AA
	HP 1.44-MB USB Diskette Drive – External	DC141B
	16-in-1 Media Reader	EM718AA
	USB Drive Key	
	HP 1-GB Drive Key II Flash Drive	AG382AA
	HP (APJ) 512-MB Drive Key II Flash Drive	ED516AA
Input Devices	Keyboards	
	HP PS/2 Standard Keyboard	DT527A
	HP USB Standard Keyboard	DT528A
	Mice	
	HP PS/2 2-Button Scroll Mouse	DD440B
	HP PS/2 2-Button Optical Scroll Mouse	EY703AA
	HP USB 2-Button Scroll Mouse	DD441B
	HP USB 2-Button Optical Scroll Mouse	DC172B
Memory	HP 1-GB PC2-5300 (DDR2-667 MHz) DIMM	PX976AA
	HP 512-MB PC2-5300 (DDR2-667 MHz) DIMM	PX975AA
	HP 256-MB PC2-5300 (DDR2-667 MHz) DIMM	PX974AA
	NOTE: The HP Compaq dx2200 Microtower memory frequency is clocked at 630 MHz.	
Audio	HP Satellite Speakers	ZD929AA
Graphics	ATI RADEON X1300 (256MB DH) PCIe Graphics Card	AH050AA
	ATI RADEON X1300 (256MB SH) PCIe Graphics Card	AG392AA

After-Market Options

Optical Drives		
	HP SATA CD-ROM Drive (available in Asia Pacific and Japan only)	AH045AA
	HP SATA CD-RW/DVD-ROM Combo Drive	AH046AA
	HP SATA DVD-ROM Drive	AH047AA
	HP SATA DVD+/-RW (DL/DF) LightScribe Drive	AH048AA
Security	HP Business PC Security Lock Kit	PV606AA
Miscellaneous Accessories	HP Firewire / IEEE 1394 PCI Card	PA997A
Monitors	CRTs	
	HP s7540 17" (16.0" vis) CRT Monitor	PF997AA#XXX
	HP v7650 17" (16.0" vis) Flat-face CRT Monitor	PF996AA#XXX
	TFTs	
	HP L1506 15" TFT Flat Panel Monitor – Analog only	PX848AA#XXX
	HP L1706 17" TFT Flat Panel Monitor – Analog only	PX849AA#XXX
	HP L1740 17" TFT Flat Panel Display – Analog/Digital	PL766AA#XXX
	HP L1755 17" TFT Flat Panel Display – Analog/Digital	PL777AA#XXX
	HP L1906 19" TFT Flat Panel Display – Analog only	PX850AA#XXX
	HP L1940T 19" TFT Flat Panel Display – Analog/Digital	EM869AA#XXX
	HP L1955 19" TFT Flat Panel Display – Analog/Digital	PD974AA#XXX
	HP L2065 20" TFT Flat Panel Display – Analog/Digital	EF227A4#XXX
	HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital	EF224A4#XXX
	GSA Monitors	
	HP L717g 17" GSA Flat Panel Monitor	EE191AA#XXX
	HP L919g 19" GSA Flat Panel Monitor	EE192AA#XXX
	Options	
	HP Flat Panel Speaker Bar	EE418AA
	HP CRT Monitor Multimedia Base	PM552AA

Memory

DDR SYNCH DRAM NON-ECC MEMORY

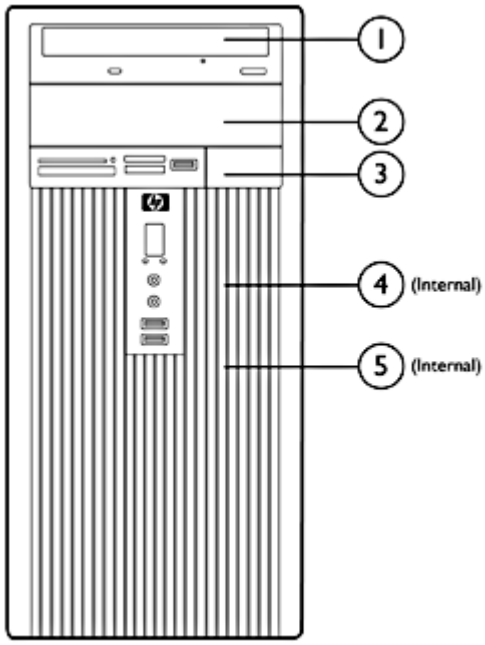
The ATI Radeon Xpress 1150 chipset supports non-ECC DDR2 memory up to PC2-5300 (667-MHz). Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations.

MAXIMUM MEMORY

Supports up to 2-GB of DDR2 SYNCH DRAM. Not all memory configurations possible are represented below.

DIMM Size	Slot 1	Slot 2
256-MB	256-MB	
512-MB	512-MB	
512-MB	256-MB	256-MB
1-GB	1-GB	
1-GB	512-MB	512-MB
2-GB	1-GB	1-GB

Storage



HP Compaq dx2250 Microtower Business PC

	Maximum Quantity Supported	Position Supported	Controller
Drive Support			
Diskette Drives	1	3	SIO
Media Reader	1	3	Internal USB 2.0 port
CD-ROM Drives	2	1, 2	IDE ATAPI
DVD-ROM Drives	2	1, 2	IDE ATAPI
CD-RW / Combo Drives	2	1, 2	IDE ATAPI
DVD+/-RW Drives	2	1, 2	IDE ATAPI
3.5” Serial ATA Hard Drives	2	4,5	SATA

Technical Specifications - Audio

Integrated Realtek ALC861 Audio	Type	Integrated
	HD Audio compatible codec	Yes
	Sampling	Supports 48/96 KHz
	Audio Jacks	Mic-In
		Line-In
		Line-Out / Headphone Out
	Power Support	Digital: 3.3V
		Analog: 5V
	Other	Meets performance requirements for audio on PC99/2001 systems High quality differential CD input

Technical Specifications - Communications

Intel PRO/1000 PT PCIe Gigabit NIC	Connector	RJ-45
	Controller	Intel 82572EI Gigabit Ethernet Controller
	Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI-E 1.0a
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T
	Boot ROM support	Yes
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps
		10BASE-T (full-duplex) 20 Mbps
		100BASE-TX (half-duplex) 100 Mbps
		100BASE-TX (full-duplex) 200 Mbps
		1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus)
	Environmental	Operating temperature 32° to 131°F (0° to 55° C)
		Operating humidity 85% at 131° F (55° C)
	Dimensions	6.4 x 2.6 x 0.8 in (16.3 x 6.6 x 1.9 cm)
	Operating system driver support	Microsoft Windows 2000 (Service Pack 4 or greater), Windows XP Home, Windows XP Professional
	Management capabilities	ASF, WOL, PXE, DMI, WFM 2.0.

HP Wireless A+G PCI	Dimensions	4.99 x 2.54 x 0.71 in (126.8 x 64.4 x 18.0 mm)
	Weight	0.268 lb (65 g)
	Controller system interface	Atheros AR5414X chipset PCI Spec 2.2
	Network standard	IEEE 802.11a/b/g
	Frequency band	5.1500 to 5.8500 GHz
		2.4000 to 2.4835 GHz
		2.4465 to 2.4835 GHz (Europe, Middle East, Asia and Asia Pacific – excluding Japan)
		2.4000 to 2.4697 GHz (Japan)
	Operating temperature	32° to 140° F (0° to 60° C), operating
	Storage temperature	-4° to 176° F (-20° to 80° C), non-operating
	Humidity	10% to 85% non-condensing

Technical Specifications - Communications

	Operating voltage	5V ± 5%
	Power consumption	Tx/Rx peak 560/250mA @ 3.3V (max.)
	Output power (approximately)	15 dBM ±2dB
	Receive sensitivity	-90dBm at 11 Mbps (typical)
	Data transfer rate	Standard rates of 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 and Super AG Mode108-Mbps
	Spreading	DSSS (Direct Sequence Spread Spectrum)
	Security	64(40h) bit, 128(104h) bit, WPA, IEEE802.1X, AES-OCB, AES-CCM, Microsoft PEAP,TKIP, WEP
	Antenna	External 5dBi antenna
	Throughput	108 Mbps (only with Belkin 54G or above router that supports 108 Mbps speed) — 200 ft (60.96 m) – Indoor
		54 Mbps — 200 ft (60.96 m) – Indoor
		11 Mbps — 200 ft (60.96 m) – Indoor
	Certifications	Wi-Fi certified
	Certifications for use by country	North America: United States, Canada Europe: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom Australia New Zealand
	OS support	Microsoft Windows XP Professional and Home Microsoft Windows 2000
Agere 56K PCI Modem	Data Transmission	56,000 Kbps maximum downstream data NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5

Technical Specifications - Communications

Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
Upgradeability	Driver upgradeable for future enhancements
Video	ITU-T V.80 video ready interface
Other	TIA/EIA 602 standard AT command set
	Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface
	Optional ring wakeup signal
Operating Temperature	32° to 158° F (0° to 70° C)
Operating Humidity	20% to 90%, non-condensing
Operating System Support	Microsoft Windows XP
OS Driver Support	Microsoft Windows XP
Power	Requires a 3.3-V auxiliary power rail on PCI bus
	Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
Connection	Single RJ-11 connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Health	Bare PCB material compliant to 94V-0 or better (marked as such)
Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

Technical Specifications - Graphics

Integrated ATI Radeon X300 graphics	3D/2D Controller	Full Microsoft DirectX® 9 based with Shader 2.0 support, full precision floating point pixel pipeline, 2x, 4x, or 6x Anti-Aliasing, hidden surface removal using 16, 24, or 32-bit Z-Buffering, and support for 12-bit per pixel formats. Support for Microsoft's DirectDraw, Double Buffering, Virtual Sprites, Transparent Blit, and Masked Blit.
	VGA/DVI Controller	Integrated
	Bus Type	PCI Express™ x16 for optional graphics upgrade
	RAMDAC	Integrated
	Memory	HYPERMEMORY™ technology offers optional dedicated Local Frame Buffer configuration for a 32-bit or 64-bit interface and up to 128MB of memory. UMA mode operation uses from 32MB up to 256MB of shared system memory.
	Controller Clock Speed	400 MHz
	Overlay Planes	Back end overlay supporting Motion Adaptive De-Interlacing
	Maximum Color Depth	32 bits/pixel
	Maximum Vertical Refresh Rate	Supports resolutions up to 2045x1536 @ 32bpp
	Multi-display Support	SURROUNDVIEW™ support for up to four monitors with an ATI discrete graphics card. Up to 2 displays can be supported via the motherboard's VGA and DVI-D connectors. An additional 2 displays can be supported via the ATI discrete graphics card. Dual independent display modes are supported.
	Operating Systems	Microsoft Windows XP and Windows 2000
	Graphics/Video API Support	Microsoft DirectX 9, DirectXVA®, VMR7, VMR9, GDI/GDI+; OpenGL® 1.4.

ATI RADEON X1300 PCIe Graphics Card (256 MB)	Bus type	PCI Express (x16 lanes)	
	Maximum vertical refresh rate	85 Hz	
	Display support	Integrated 400 MHz RAMDAC	
	Display max resolution	2048 x 1536	
	Board display options	DVI-I + TV DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector) DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle) TV connector is a 4-pin mini-DIN S-video connector	
	Board configuration	Specification	Description
		Graphics Chip	RV515

Technical Specifications - Graphics

	Core clock	450 MHz
	Memory clock	250 MHz
	Frame buffer	256 MB DDR2
Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish	
Operating systems support	Windows 2000, Windows XP, Linux x86 and x86_64 distributions using XFree86 or X.Org*. *Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website (http://www.hp.com/wwsolutions/linux/products/clients/) for support information.	
Core power	25 W (Max board power)	
Option kit contents	• ATI RADEON X1300 PCIe graphics card with full height bracket attached • Low profile bracket • DVI-to-VGA Adapter • Software CD with graphics drivers • Warranty documentation	
Compliance standards	EMC Emissions: a) FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment c) Canadian Standard ICES-003 is equivalent to CISPR22 d) Taiwanese Standard BSMI e) Japanese VCCI f) Australian C-Tick EMC Immunity: CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement. Safety: UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements.	

Technical Specifications - Input / Output Devices

HP PS/2 or USB Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		MicrosoftPC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Operating system	Microsoft Windows XP Professional, Microsoft Windows XP	

	support	Professional x64 Edition, Red Hat Enterprise Linux Workstation 3	
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	
HP 2-Button Scroll Mouse (PS/2 or USB)	Scroll Wheel	8 mm	
	Maximum Rotation Speed	30 mm/s	
	Switch Type	Light force micro-switch	
	Switch Life	1 million operations	
	Mechanical Life	Minimum 200,000 revolutions	
	Environmental	Operating Temperature	50° to 122° F (10° to 50° C)
		Non-operating Temperature	-22° to 140° F (-30° to 60° C)
		Operating Humidity	10% to 90% (non condensing at ambient)
		Non-operating Humidity	20% to 80% (non condensing at ambient)
		Operating Shock	40 g, 6 surfaces
		Non-operating Shock	80 g, 6 surfaces
		Operating Vibration	2 g peak acceleration
		Non-operating Vibration	4 g peak acceleration
	Electrical	Operating Voltage	+ 5VDC ± 10%
		Power Consumption	15mA
		System Consumption	PS/2 mini-din connector
		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		PC98	Functionally compliant
	Mechanical	Resolution	400 ± 20% DPI
		Tracking Speed	10 in/s maximum
		Acceleration	100 in/s
		Switch Actuation	85 g nominal peak force
		Switch Life	1,000,000 operations (using Hasco modified tester)
		Cable Length	2 m
		PC98-99	Mechanically compliant
	Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick	

Technical Specifications - Hard Drives

Serial ATA Hard Drives (7200 rpm)	80 GB	Capacity	80,026,361,856 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	156,301,488	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	160 GB	Capacity	160,041,885,696 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	312,581,808	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	250 GB	Capacity	250,059,350,016 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous	3.0 Gb/s	

Technical Specifications - Hard Drives

Transfer Rate (Maximum)		
Buffer	8 MB	
Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.8 ms
	Average	<9.0 ms
	Full-Stroke	• 17 ms
Rotational Speed	7,200 rpm	
Logical Blocks	488,397,168	
Operating Temperature	41° to 131° F (5° to 55° C)	

SATA DVD-ROM Drive	Height	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)		
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	Weight (max)	2.6 lb (1.2 kg)		
	Read speeds	DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 8X	
		DVD-ROM	Up to 16X	
		DVD-RAM	Up to 4X	
		CD-ROM, CD-R	Up to 48X	
		CD-RW	Up to 32X	
	Removable Storage – Media Compatibility – DVD-ROM	Media	Read	Write
		CD-ROM	Yes	No
		CD-R	Yes	No
		CD-RW	Yes	No
		DVD-ROM	Yes	No
		DVD-ROM DL	Yes	No
		DVD-RAM	Yes	No
		DVD+R	Yes	No
		DVD+R DL	Yes	No
		DVD+RW	Yes	No
		DVD-R	Yes	No
		DVD-RW	Yes	No
		DVD-R DL	Yes	No
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
		Cache Buffer	2 MB (minimum)	
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	

Technical Specifications - Optical Storage

	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC – <1000 mA typical, < 1600 mA maximum 12 VDC –< 600 mA typical, < 1400 mA maximum
	Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)
	Operating systems support	Microsoft Windows 2000, Windows XP Professional, Windows XP Home	
SATA CD-RW/DVD-ROM Combo Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speeds	CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 8X
		DVD-ROM	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (typical), CD: < 210 ms (typical)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
			12 VDC (< 600 mA typical, < 1400 mA maximum)

	Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)
	Operating systems support	Microsoft Windows 2000, Windows XP Professional, Windows XP Home	
SATA DVD+/-RW LightScribe Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speeds	DVD+R	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 4X
		DVD-R	Up to 16X
		DVD-RW	Up to 6X
		CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	DVD-RAM	Up to 4X
		DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
		DVD-ROM, DVD+R, DVD-R	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	Random	DVD: < 130 ms (typical), CD: < 120 ms (typical)
		Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p

Technical Specifications - Optical Storage

	DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)
		12 VDC (< 600 mA typical, 1400 mA maximum)
Environmental conditions (operating – non-condensing)	Temperature	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 90%
	Maximum Wet Bulb Temperature	86° F (30° C)
Operating systems support	Microsoft Windows 2000, Windows XP Professional, Windows XP Home	

Technical Specifications - Removable Storage

HP 1.44-MB Diskette Drive	Size	3.5 in (8.89 cm)	
	LED Indicators (front panel)	Green	
	Read/Write Capacity per Diskette (high/low)	1.44 MB/720 KB	
	Drive Height	One-third	
	Drive Rotation	300 rpm	
	Transfer Rate (high/low)	500/250 KB/s	
	Bytes/Sector	512	
	Sectors/Track (high/low)	18/9	
	Tracks/Side (high/low)	80/80	
	Access Times	Track-to-Track (high/low)	3/6 ms
		Average (high/low)	94/173 ms
		Settling Time	15 ms
		Latency Average	100 ms
	Cylinders (high/low)	80/80	
	Read/Write Heads	Two	

HP 16-in-1 Media Card Reader	USB interface	USB 2.0 High-speed device via PCI card or pass-through via internal USB port of system board
	Advance protocol support	• Supports hardware ECC (Error Correction Code) function • Supports hardware CRC (Cyclic Redundancy Check) function • Supports MS 4-bit parallel transfer mode • Supports MS-PRO 4-bit parallel transfer mode • Supports SD 4-bit parallel transfer mode • Supports high-speed 50 MHz SD 4-bit card (version 1.1) • Support high-speed 52 MHz MMC 8-bit card (version 4.x)
	Supported media types	• Supports CompactFlash Card Type I (CF I), CompactFlash Card Type II (CF II),MicroDrive (MD) • Supports 3.3V SmartMedia Card (SM), SmartMedia ROM (SM ROM), xD-Picture Card (xD) • Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard (MMC), Secure MultiMediaCard (Secure MMC), ROM Type MultiMediaCard (MMC ROM), Reduced Size MultiMediaCard (RS MMC), MultiMediaCard 4.0 (MMC Plus), Reduced Size MultiMediaCard 4.0 (MMC Mobile) • Support Memory Stick (MS), Memory Stick ROM (MS ROM), MagicGate Memory Stick (MG), Memory Stick Select, Memory

Technical Specifications - Removable Storage

		Stick Duo (MS Duo), Memory Stick PRO (MS-PRO), Memory Stick PRO Duo (MS PRO Duo)
Mechanical	Length (3.5")	124.7 cm
	Width (3.5")	101.6 cm
	Height (3.5")	25.4 cm
	Length (5.25")	171.6 cm
	Width (5.25")	148.9 cm
	Height (5.25")	42.7 cm
Environmental	Operational environmental extremes	Test Parameters/Conditions - Power applied, unit operating on system ±5% nominal supply voltage. 10°C 10% R.H. ƒ 24 hours 10°C 90% R.H. ƒ 24 hours 20°C 90% R.H. ƒ 24 hours 30°C 90% R.H. ƒ 24 hours 40°C 90% R.H. ƒ 24 hours 50°C 90% R.H. ƒ 24 hours 50°C 10% R.H. ƒ 24 hours
	Storage environmental extremes	Test Parameters/Conditions 60°C @ 80% R.H. for 96 hours -30°C @ 20% R.H. for 48 hours No power applied Delta °C < 1.0°C/min Delta % R.H. < 1.5% R.H./min
Operating system support		Microsoft Windows 2000 (Service Pack 3 or greater), Windows XP Home, Windows XP Professional
Approvals		USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2 FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T

Technical Specifications - Environmental Data

Environmental Data

Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Energy Star
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- IT ECO declaration

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Convertible Mini tower Desktop model included:

Processor	AMD Sempron 3600+
Memory	512-MB DDR2 Synch DRAM (2 x 256-MB)
Hard Drive	80-GB SATA (7200 rpm)
Optical Drive	HP DVD ROM
Other Storage	16-in-1 Media Reader
Communications	Integrated Realtek 8100C Fast Ethernet Network Connection, Agere 56K PCI Modem

Ultra-Slim Desktop, Small Form Factor, Convertible Minitower

Energy Consumption

	115VDC	230VDC	100VDC
Normal Operation	61.1 W	61.0 W	60.3 W
Sleep	2.88 W	2.9 W	2.75 W
Off	1.63 W	1.68 W	1.51 W

Heat Dissipation*

	115VDC	230VDC	100VDC
Normal Operation	208.53 BTU/hr	208.19 BTU/hr	205.80 BTU/hr
Sleep	9.83 BTU/hr	9.9 BTU/hr	9.37 BTU/hr
Off	5.56 BTU/hr	5.73 BTU/hr	5.15 BTU/hr

*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

	Sound Power (L_{Wad}, bels)	Deskside Sound Pressure (L_{pAm}, decibels)
Idle	4.18	31.4
Fixed Disk (random writes)	4.21	35.9
Optical Drive (sequential reads)	5.2	46

Longevity and Upgrading

This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 15 months after the end of production.

Upgradeability features contained in the product include:

- 6 USB ports
- 2 external 5.25" drive bays
- 2 internal 3.5" drive bays
- 1 external 3.5" drive bay
- 2 empty standard PCI slots
- 1 empty standard PCI-EX1 slot
- 1 empty standard PCI-EX 16 slot
- 2 memory slots
- 1 Serial port
- 1 Parallel port

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Battery size: CR2032 (coin cell)
Battery type: Lithium

Additional Information

This product is in compliance with the IEEE 1680 (EPEAT) standard at the SILVER level, see http://www.epeat.net.

This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

This product contains 70.6% recycled materials (by wt.)

This product is 70.6% recycle-able when properly disposed of at end of life.

Packaging Materials

- External:

- Corrugated Paper 1840 g
- Internal:
  - LDPE Foam 280 g
  - LDPE Bag 50 g

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and

corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

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